Space Weather Forecast

Issued on Monday, 10 January 2022 at 00:33 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Increasing slight chance of Moderate-class flares (R1-R2 radio blackouts).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Very Low over the past 24 hours, with only very minor flares. There are currently four sunspots on the visible disc. The most notable is a large region near the southern centre disc, which has shown some slight decrease in magnetic complexity. The other three spots are all small and simple, although the region near the southeast limb is still foreshortened making classification a little uncertain. There is an area of magnetic flux which has rotated onto the northeast limb which shows a fair amount of complexity, but no spots at present, and will be monitored.
No confirmed Earth-directed Coronal Mass Ejections (CMEs) have been observed in currently available imagery.

Solar Wind / Geomagnetic Activity: Solar winds, as observed by DSCOVR at L1, have been slightly elevated to elevated due to connection with a High Speed Stream from CH43/- . Solar wind speeds started around 470 km/s, before rising steadily to around 550 km/s at 09/0830 UTC, after which they have slowly eased back to around 450 km/s. . The Interplanetary Magnetic Field was strong to start, before declining back to weak levels after 09/0700 UTC. The important north-south component was moderate to start, before easing back nearer neutral after 09/0700 UTC. Geomagnetic activity was Unsettled before becoming Quiet from 09/0300 UTC, with a further Unsettled interval from 09/2100 UTC.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain Low or Very Low, with further Common-class flares possible. In addition, there is an increasing daily Slight Chance of Moderate-class flares, as several returning regions are expected to rotate onto the visible disc over the coming days.
Solar Wind / Geomagnetic Activity: There are currently no Earth-directed CMEs in the forecast. We currently have slightly-elevated wind speeds from a coronal hole, which are expected to slowly ease through Day 2 (11 Jan). Geomagnetic activity is likely to be Quiet to Unsettled, with a chance of Active intervals through Day 1 (10 Jan). The likelihood of further G1/Minor Storm intervals is now considered very low. Activity is then expected to be mainly Quiet through Days 2 to 4 (11-13 Jan).
Energetic Particles / Solar Radiation: No solar radiation storms are expected, although there is a very slightly increasing risk with the westward progression of the current front-sided sunspots.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	15	15	20
Very Active	R3 to R5 X	No	1	1	1	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	2	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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